

REMARKS

Claims 1-21 were examined. Claims 1 and 12 are amended. Claims 6, and 22-29 are canceled. Claims 1-5, and 7-21 remain in the Application.

The Patent Office rejected claims 1-21 under 35 U.S.C. §103(a). Reconsideration of the rejected claims is respectfully requested in view of the above amendments and the following remarks.

A. 35 U.S.C. §103(a): Rejection of Claims 1, 6, 9, 11-12, 19 & 21

The Patent Office rejects claims 1, 6, 9, 11-12, 19 and 21 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 5,321,533 of Kumar (“Kumar”). In the relevant language cited by the Examiner, Kumar coats a solution of ferroelectric material ZLI-3234 on an ITO coated glass plate with a barrier layer of Si₂. The glass plate was left over night to allow the solvent to evaporate leaving a thin film comprising droplets of liquid crystal disbursed in transparent polymer. A second plate was put on top of the coated plate and the two were clamped together. The cell was heated to 150 °C, put under a pressure of 20 psi in a hot press, and then cooled at rate of about 1 °C/min. to 30 °C. The SiO₂ was removed from areas of the plate outside the cells and wire leads were soldered to the ITO surface. An electrical signal comprising alternating positive and negative square pulses of variable period and amplitude was applied and the switching characteristics of the cell observed. [See col. 2, lines 27-45]

As noted above, Kumar puts its ferroelectric material between plates, heats the cell then cools the cell, then applies an electric field using the plates as the electrodes. Kumar does not align a plurality of domains in its ferroelectric material prior to cooling the cell. Further, Kumar does not expose the ferroelectric material to an external electrical field.

Claims 1, 9, and 11 describe a method comprising heating a ferroelectric polymer, comprising a polymer material formed on a substrate to a temperature of at least as high as a Curie temperature of the polymer material; exposing the polymer material to an electrical field; aligning a plurality of domains of the polymer material; and cooling the temperature of the

polymer material while maintaining the alignment of the domains. The aligning must precede the cooling in claim 1.

Claims 1, 9 and 11 are not obvious over Kumar, because Kumar does not describe a method of heating a ferroelectric material to a temperature at least as high as a Curie temperature of a polymer material; exposing the polymer material to an external electric field; aligning a plurality of domains of the polymer material prior to cooling the temperature of the polymer while maintaining alignment of the domains of the polymer material. As noted above, Kumar heats, cools, then applies an electric field.

Claims 1, 9 and 11 are also not obvious over Kumar, because Kumar does not describe exposing a polymer material to an external electrical field. As noted above, Kumar uses the plates of the cell including the liquid crystal material to generate its electrical signals.

Claims 12, 19 and 21 describe a method including heating a ferroelectric polymer comprising a polymer material formed on a substrate to a temperature at least as high as a Curie temperature of the polymer material; applying an external electric field to the polymer material to align a plurality of domains of the polymer material; and cooling the temperature of the polymer material while maintaining application of the electric field to the polymer.

As noted above, Kumar does not disclose heating, applying an external electric field, then cooling as described. Kumar also does not describe applying an external electric field to its ferroelectric material.

Applicants respectfully request that the Patent Office withdraw the rejection to claims 1, 9, 11-12, 19 and 21 under 35 U.S.C. § 103(a).

B. 35 U.S.C. § 103(a): Rejection of Claims 2, 4, 7-8, 13, 15, 17 & 18

The Patent Office rejects claims 2, 4, 7-8, 13, 15, 17 and 18 under 35 U.S.C. § 103(a) as obvious over Kumar in view of U.S. Patent No. 3,490,050 of Weiner (“Weiner”). Weiner is cited for disclosing an apparatus to use an electric field to align particles.

Claims 2, 4, 7 and 8 depend from claim 1 and claims 13, 15, 17 and 18 depend from claim 12. As noted above with respect to independent claim 1 and independent claim 12, Kumar does not disclose the heating, applying an electric field, then cooling its ferroelectric material as described in those claims. Kumar also does not disclose applying an external electric field. Weiner does not cure the defects of Kumar. Further, it is questionable whether Weiner could be combined with Kumar, since Kumar applies its own electric field through the plates of the cell it creates.

Applicants respectfully request the Patent Office withdraw the rejection of claims 2, 4, 7-8, 13, 15, 17 and 18 under 35 U.S.C. §103(a).

C. 35 U.S.C. §103(a): Rejection of Claims 3, 10, 14 & 20

The Patent Office rejects claims 3, 10, 14 and 20 under 35 U.S.C. §103(a) as obvious over Kumar in view of U.S. Patent Publication No. 2004/0131862 of Szmanda, et al. ("Szmanda"). Szmanda is cited for disclosing a polymer material comprising poly(vinylidene fluoride-trifluoroethylene).

Claims 3 and 10 depend from claim 1 and claims 14 and 20 depend from claim 12. As noted with respect to claims 1 and 12, Kumar does not disclose a method involving heating a ferroelectric material, applying an external electric field, then cooling the polymer material. Szmanda does not cure the defects of Kumar.

For the above stated reasons, Applicants respectfully request that the Patent Office withdraw the rejection to claims 3, 10, 14 and 20 under 35 U.S.C. §103(a).

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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